

Beech Street Crosswalk Study and Report

A traffic accident occurred September 2024 where a pedestrian was struck by a motor vehicle while crossing Beech Street to access the playground. The pedestrian crossed the roadway at an undesignated crossing area, not a marked crosswalk.

The candidate crosswalk proposal is valid due to this location meeting the following standard:

The issue is with a specific unsignalized and uncontrolled crossing on a specific street or intersection of streets.

Existing established crosswalks are located 520 feet west (Waverly Street) and 400 feet east (Upland Road) from the playing field.

Table One: Preliminary Evaluation Criteria

Criteria	Evaluation
Vehicles Not Stopping	If more than 3 vehicles drive through the crosswalk, from either direction, before the traffic stops, a wait time condition has been determined if this situation is documented on three different days in a two-week period.
Excessive Crossing Distance	If the width of the roadway, measured from the edge of the crosswalk to the opposite edge or a raised pedestrian island, whichever is less, is more than 26 feet, then excessive crossing distance has been determined.
Traffic Collisions	Any collision involving an automobile and a pedestrian (including cyclist) in the crosswalk, that results in a Police report, establishes collisions as a problem.

Roadway Attributes:

- Beech Street is a public roadway situated between Waverly Street and Trapelo Road categorized as a minor collector roadway.
- Right of way width: 40 Feet
Roadway width: 26 Feet
Number of travel lanes: 2 lanes
Travel lane width: 13 Feet
Sidewalk width: 5-foot concrete sidewalk with 2-foot vegetation strip, both sides of roadway
Curbing: Granite curbing with average of 4-inch curb reveal
Grade: 0.7% from Upland Road to Orchard Street, then 0.3% to intersection at Waverly Street.
Pavement condition: 86/100 per 2025 PCI survey completed by VHB
Bike Lanes: Not present
Roadway Speed Limit: 25 MPH, not posted
Regulatory Traffic Signage: No parking signs posted between Waverly Street up to Drew Road. A warning sign, W15-1, is posted on the utility pole 20 feet south of the Orchard Street intersection.
On-Street Parking: Parking is restricted on the park side of the roadway from Waverly Street to Drew Road. There is a designated on-street parking area between Drew Road and Upland Road. On the opposite side of the road, parking is not restricted from Upland Road to Waverly Street.

A traffic study was completed at 265 Beech Street by the Belmont Police Department and Engineering Division from 05/17/2024 to 05/23/2024. The following data was collected:

Day	Date	Daily Traffic	85th % Speed	Average Speed	Peak Hour Traffic	% Peak Hour/Daily
		Volume	MPH	MPH	Volume	Percent
Friday	5/17/2024	3075	26.6	22.3	287	9.33
Saturday	5/18/2024	2260	26.6	20.7	208	9.20
Sunday	5/19/2024	1808	28.5	23.7	166	9.18
Monday	5/20/2024	2957	26.6	22	258	8.73
Tuesday	5/21/2024	2920	26.6	22.3	245	8.39
Wednesday	5/22/2024	3184	26.6	21.7	257	8.07
Thursday	5/23/2024	2577	27	22	257	9.97
Average:		2683	26.9	22.1	240	8.98

85% Percentile Speed: 27 MPH – does not exceed 5 MPH over posted speed limit

Peak Hour ADT: 9% - does not exceed 10% of daily traffic

The select board traffic calming policy is not required based on the traffic study results not exceeding the required minimums of speeding and cut through traffic volumes. Crosswalk placement is an engineering exercise and additional studies shall be completed. Per the criteria evaluation of the crosswalk safety improvement policy, the following standards are reviewed to determine the eligibility for proposed sidewalks:

Pedestrian Counts:

Study 1: Completed 09/29/2025 between 2:30PM and 4:30PM

Total pedestrian crossings at unmarked locations: 81

Total pedestrians crossing at Upland Road crosswalk: 70

Study 2: Completed 09/30/2025 between 7:00AM and 9:00AM

Total pedestrians crossing at unmarked locations: 29

Total pedestrians crossing at Upland Road crosswalk: 65

High pedestrian volume has been established (excess of 25 crossings during school hours)

Stopping sight distance (SSD): Per AASHTO, stopping sight distance for a 25 MPH roadway is 155 feet.

CRITERIA	CRITERIA THRESHOLD	SCORE	BEECH STREET SCORE
Speeding	For each 5-mph increment that the 85 th percentile speed is above the legal speed limit	10	0
Traffic Volume (A)	Average daily traffic volume less than or equal to 3000	0	0
Traffic Volume (B)	ADT in range of 3001 – 8000	10	0
Traffic Volume (C)	ADT volume greater than 8000	20	0
High Pedestrian Volume	More than 25 pedestrians using the crossing during 7a-9a and 3p-6p periods averaged over 3 different days when Belmont Public Schools are in session	10	10
Stopping Sight Distance	For each 10 feet less than the required stopping sight distance	10	0
Obstructions	For each instance of an obstruction limiting visibility of pedestrians using crosswalk	10	10
School Walking Route	Crosswalk is located along a designated school zone	20	0
Proximity to Commercial District	Crosswalk is located within 200 feet of a commercial district	20	0
Collisions – Personal Injuries	For each vehicle collision with a pedestrian or cyclist, or other incident, in the last 5 years that resulted in a police report	80	80
TOTAL	POINTS	180	100

Criteria points for Beech Street are 100 out of a possible 180.

Conclusion & Proposal:

Based on the studies completed, it is established that pedestrian crossings occur at a high frequency, specifically when pedestrians are accessing the playing field. A majority of pedestrians cross at the intersections of the Orchard Street, Benjamin Road, and Drew Road as they enter Beech Street. There is also a high volume of motorized and regular bicycles and scooters that traverse down the intersecting roadways onto Beech Street.

The Engineering Division studied three proposed locations for mid-block crossings on Beech Street near the playing field. Stopping sight distances are limited between Orchard Street and Benjamin Road because of the existing curvature in the roadway and due to large shade trees. Additionally, on street parking along the west side of the roadway limits pedestrian vision for crossing from intersecting roadways to the playing field.

Due to roadway geometry limiting stopping sight distance, the Engineering Division recommends a raised crosswalk to be installed at Station 5+10 to 5+36 as depicted on the supplementary plans. The raised crosswalk will include a 4-foot curb bump out along the western side of the sidewalk to reduce crossing distances to 22-feet from the original 26-foot crossing. MUTCD signage will be installed in advance of and at the crosswalk, and thermoplastic line striping will be applied as depicted on the supplementary plans. Additional measures are to install additional MUTCD signage near the gated access to the playing field to deter unauthorized crossings using R9-2 “Cross Only At Cross Walk” on both sides of the roadway (Stations 2+61 & 2-87). The Engineering Division recommends parking restrictions along the west side from Benjamin Road to Drew Road where the curb extension and raised crosswalk will be installed (Station 5+00 to 6+50). This will reduce on street parking by 6 spaces but is crucial to establish appropriate stopping sight distances from both directions. It is also recommended a stop sign and bar are installed at the intersection of Orchard Street approaching Beech Street to replicate the existing conditions of Benjamin Road and Drew Road as means to control the intersection traffic in an appropriate manner. Lastly, to increase pedestrian safety along Beech Street, it is recommended that MUTCD signage be installed at the existing crosswalk at Upland Road including advanced warning signs that conform to MUTCD standards. An add alternate proposal is included to install solar powered rapid flashing beacons at both crosswalks.

The following cost estimate was prepared using MassDOT weighted bid prices:

Add alternate including solar powered rapid flashing beacons.

Item No	Item Description	Unit	Estimated Quantity	Unit Price Estimate	Total Price
1	Unclassified Excavation	CY	50	\$ 100.00	\$ 5,000.00
2	Gravel Borrow	CY	20	\$ 65.00	\$ 1,300.00
3	P-5 Post Assembly	EA	16	\$ 200.00	\$ 3,200.00
4	MUTCD Signs	SF	40	\$ 25.00	\$ 1,000.00
5	R&S Granite Curb	LF	12	\$ 20.00	\$ 240.00
6	R&R Granite Curb - Straight	LF	26	\$ 60.00	\$ 1,560.00
7	F&I Granite Curb - Straight	LF	10	\$ 80.00	\$ 800.00
8	F&I Granite Curb - Radius	LF	16	\$ 110.00	\$ 1,760.00
9	Cement Concrete	SY	45	\$ 225.00	\$ 10,125.00
10	Detectable Panel	EA	2	\$ 250.00	\$ 500.00
11	Hot Mix Asphalt - Binder	TONS	10	\$ 225.00	\$ 2,250.00
12	Hot Mix Asphalt - Top	TONS	10	\$ 250.00	\$ 2,500.00
13	Thermoplastic Pavement Markings	SF	200	\$ 5.00	\$ 1,000.00
14	Loam & Seed	SY	10	\$ 50.00	\$ 500.00
	Total Estimate				\$ 31,735.00
	10% Contingency				\$ 3,173.50
	Project Estimate				\$ 34,908.50

ADD ALTERNATE W/ SOLAR RRFB

Item No	Item Description	Unit	Estimated Quantity	Unit Price Estimate	Total Price
ALT-1	Rapid Flashing Beacon Assembly	EA	1	\$ 17,900.00	\$17,900.00